

CHAPTER FIVE

**ENVIRONMENTAL QUALITY ELEMENT**

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## **5.0 ENVIRONMENTAL QUALITY ELEMENT**

**The Goals of the Environmental Quality Element are to:**

**Conserve and improve the environmental quality of the City. Continue an emphasis on improving the physical environment of Santa Clara.**

### **5.1 INTRODUCTION**

Urbanization of the Santa Clara Valley has resulted in irreversible changes to the natural environment, including loss of native vegetation and wildlife, new water drainage patterns, and increasing noise, water and air pollution. These changes provide a challenge to the area to effectively protect environmental resources now and in the future.

It is necessary to look at the General Plan as an integrated whole, since statutory requirements that are addressed in this element overlap and intertwine with other elements such as Land Use, Housing, Transportation, and Public Facilities and Services.

### **5.2 SEISMIC and SOIL CONDITIONS**

The Seismic and Soil information ensures the consideration of potential natural and man-made hazards in land use planning. Through this effort, injury and damage can be reduced and disaster relief costs minimized.

The range of hazardous considerations that may influence decisions includes seismic conditions, soil stability, and flooding. Through building and land use controls, the effects can be minimized by imposing special criteria or by modifying natural conditions. The impacts of the hazards can also be reduced through operational procedures for disaster recovery.

#### **5.2.1 Seismic Conditions**

Seismic activity is the result of either the actual movement of the earth or a reaction of the underlying soils to the earthquake or a combination of both causes.

Santa Clara Valley is a region of high seismic activity, as is all of California. It is likely that an earthquake with a magnitude equal to or greater than those which have occurred in this area in the past will happen again in the future.

No earthquake faults identified as active are located within the City of Santa Clara (see Fault Zone Diagram). The City is, however, seven miles from both the San Andreas and Calaveras Faults and five miles from the Hayward Fault. The closer Stanford and Silver Creek Faults have not been active in historic times.

Depending on the underlying geology, soil conditions and slope, individual sites behave differently during the same earthquake. Using these factors, the State Division of Mines and Geology has mapped the relative seismic stability of land within the City (see Relative Seismic Stability Diagram and Table).

**(a) Ground Rupture**

Because there are no known active earthquake faults within the limits of the City of Santa Clara, it is reasonable to assume that there will be no damage from actual ground rupture from faulting.

**(b) Ground Shaking**

The most widespread effect of an earthquake and usually the greatest cause of property damage and personal injury is ground shaking. The effects of ground motion on buildings depend on the characteristics of the shaking and the characteristics of the building. Other structural factors such as type and quality of materials and workmanship are also important. The main consideration is the capability of the foundation as a structural system to respond to earthquake ground motion as an integral unit.

Regulations within the Uniform Building Code and other State mandated requirements incorporate seismic information and considerations. Structures built in accordance with these regulations should be able to: 1) resist minor earthquakes without damage; 2) resist moderate earthquakes without structural damage but with some non-structural damage; 3) resist major earthquakes without collapse but with some repairable structural damage as well as non-structural damage; and 4) resist major earthquakes, equal to the strongest experienced in California, without collapse but with major nonstructural and structural damage which may not be repairable.

More than 90 percent of the buildings in Santa Clara were built under modern building codes and are, therefore, considered to present lower risks for users and owners. Most older structures in Santa Clara are one-story and two-story and are built with materials and types of constructions likely to survive anticipated shaking with minimal damage.

Typical wood frame construction can withstand severe shaking and can even be thrown off its foundation without collapse. Buildings that deteriorate to an unsafe condition are subject to the Uniform Code for the Abatement of Dangerous Buildings, which requires that they be improved or demolished.

**Figure 5-A:**  
**EARTHQUAKE FAULTS**

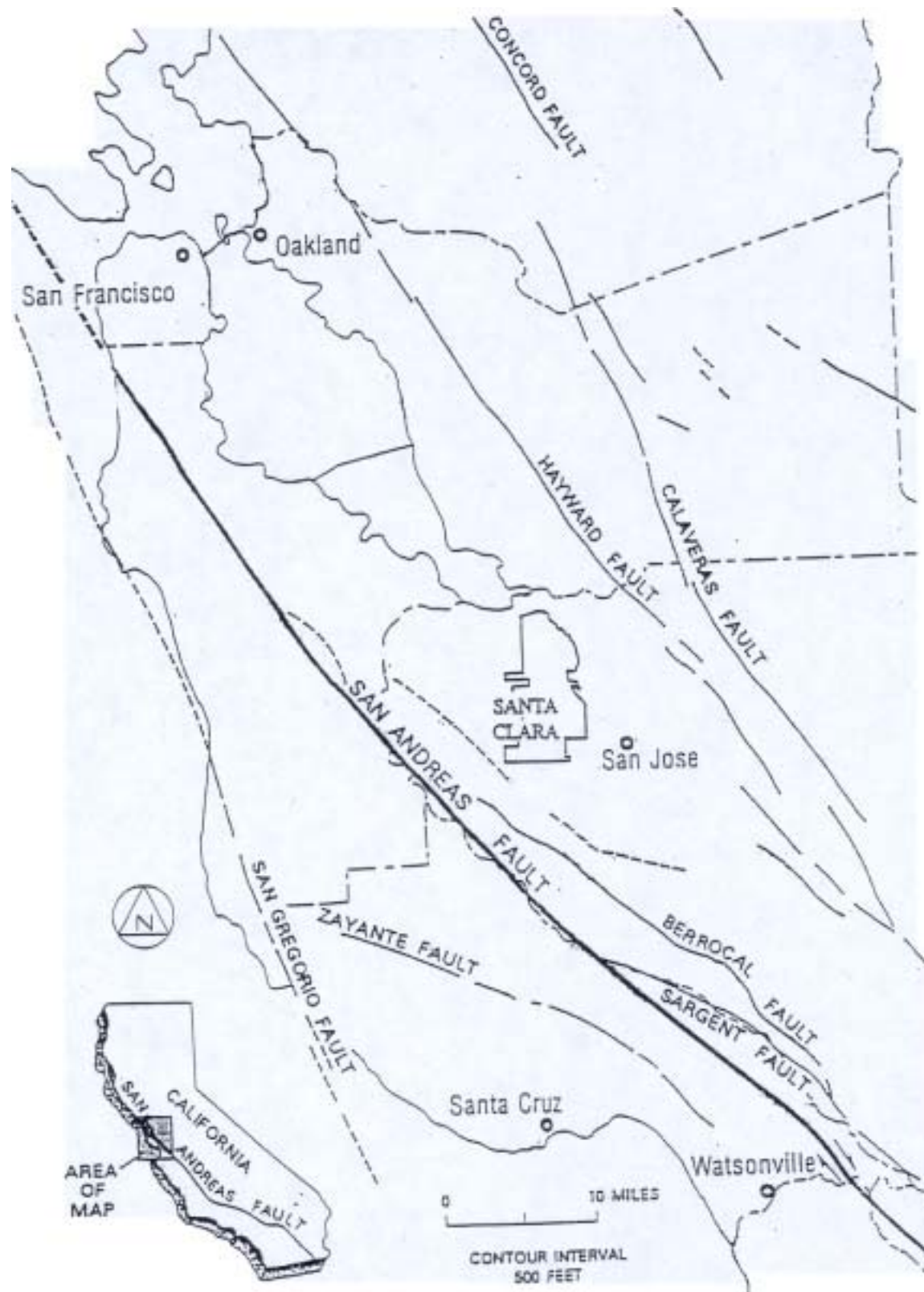


Figure 5-B:

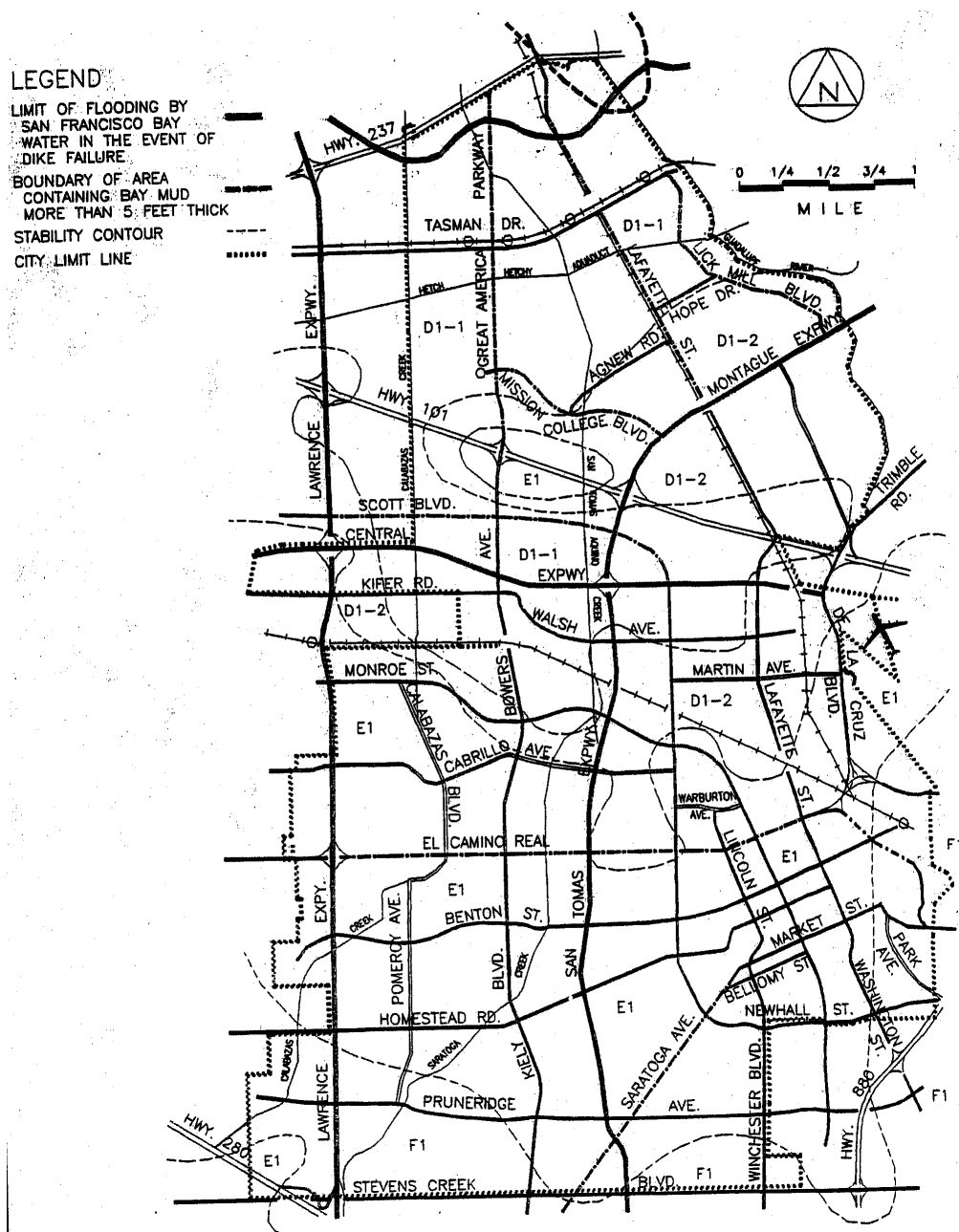
**RELATIVE SEISMIC STABILITY**

Figure 5-C:

**RELATIVE SEISMIC STABILITY**

Site-Investigation Need Zone	Geotechnical Problems to be Considered In Detail by Site Investigation	Characteristic Features
D1	Areas of high potential for liquefaction, lurching and lateral spreading. D1-1 : Water table 0 to 10 feet below surface. D1-2 : Water table 10 to 20 feet below surface.	Water table less than 20 feet below ground surface. Lateral spreading and lurching potential highest adjacent to stream channels. D1 areas have a relatively higher potential for liquefaction, but are not high risk areas compared with D, Ds, Df and Dc zones. Liquefaction was rare in the County in 1906 and is not known to have occurred in the City of Santa Clara from the strongest shaking known in the Bay Area. The County does not require automatically geological investigations in D1 areas.
Major Geotechnical Hazards	D Site Investigations Mandatory	Peat deposits or compressible bay mud thicker than 5 feet. Elevation 0 to 5 feet above sea level.
Moderate Geotechnical Hazards	Dc Areas of High potential for liquefaction and differential settlement Df Areas of high potential for flooding from tsunami overtopping dikes.	Water table ranges 20 to 50 feet below ground surface.
Minor Geotechnical Hazards	E1 Areas of moderate potential for liquefaction, lurching and lateral spreading. F1 Areas of low potential for liquefaction, lurching and lateral spreading.	Hillside areas or Valley areas where water table is deeper than 50 feet below ground surface.

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**(c) Liquefaction**

Liquefaction occurs when water-saturated soils composed of silt or gravel are subjected to shaking by an earthquake. If the water is unable to drain, the soil assumes the property of a heavy liquid and no longer provides adequate support for foundations, buildings or upper layers of soil. Such liquefaction can cause severe damage to structures as a result of settling, tilting, or floating. Where natural or manmade earth hazards or poor soil conditions can not be avoided, there are ways to reduce the risks of liquefaction, lurching, and lateral spreading, to acceptable levels. The ways to reduce and minimize such risks include, but are not limited to, dewatering and drainage, compaction by various means, rock bolts, piles or caissons, keyed-in continuous foundation walls, chemical treatment, cement injections, vibro treatment, well drained retaining walls, and meeting building code requirements for new construction. The areas of potential liquefaction within the City are noted on the Relative Seismic Stability Diagram.

**(d) Differential Settlement**

When loose or medium density soils are subjected to shaking, they can become compacted. Differential or uneven settlement beneath a building can cause serious structural damage. Prolonged shaking of the alluvial soils of the Valley could cause such settlement, particularly if liquefaction of deeper soils occurs. For a discussion of local soil conditions see the section on Soil Conditions below.

**(e) Flood Hazards due to Seismic Activity**

If the Lexington Reservoir Dam failed, flooding is not expected to be a significant hazard to Santa Clara because of its distance (nine miles) from the reservoir.

Similarly, the distance of Santa Clara from the Bay and the intervening salt ponds and levees is expected to provide adequate protection against waves generated by earthquakes. The only exception is the area between State Route 237, Guadalupe River, Lafayette Street and Santa Clara Golf Course.

**5.2.2 Soil Conditions**

The floor of the Santa Clara Valley has been built up over many thousands of years through a process of erosion of soils from the surrounding mountains and the deposit of these sediments in the Valley. As a result of this process, the topography of the City is very level and there are no significant mineral resources. The absence of mineral resources is relevant to the Land Use Element, which otherwise requires an analysis of the resources and provisions to ensure their continued availability. Under the City of Santa Clara, these sedimentation layers are considered generally stable under nonseismic conditions. This stability is enhanced by the lack of steep slopes within the City of Santa Clara. The elevations of the City reach 160 feet in the southwest corner and fall off gradually to approximately five feet on the northernmost boundary.

**(a) Weak Soils**

The area within the City of Santa Clara which is underlain by Bay mud is the northern portion south of Route 237. This area is partially used for a storm drainage retention basin and the remainder for sanitary landfill.

**(b) Expansive Soils**

Many high clay content soils within the Santa Clara Valley are expansive. Shrink-swell characteristics are triggered by the change in the amount of water within these soils. The soil swells when the water content is increased and shrinks when decreased. This condition requires special design considerations where applicable.

**(c) Erosion**

Because of the City's flat terrain and well-established creek channels, erosion is not a significant hazard within the City.

**(d) Sanitary Landfill**

Sanitary fill exaggerates the shaking motions of earthquakes affecting the site. Approximately 300 acres are planned for sanitary landfill to a depth of 30 feet. When the landfill process is complete, this land may become available for development. At that time, the structural characteristics of the land will require special design considerations and impose constraints on the type of development that may occur.

**5.2.3 Subsidence**

Subsidence is a gradual lowering of an area of ground which in turn may create flooding problems. Northern Santa Clara has had significant subsidence due to a drop in the underground water levels. This decline was the result of more water being removed from the underground sources than was being replaced. The Santa Clara Valley Water District has a program of recharging the ground water basin with imported as well as local water to reduce subsidence, and ground water levels were in equilibrium as of 1990.

**5.3 FLORA AND FAUNA**

Urban development has occurred throughout the Santa Clara Valley and has introduced new vegetation and species. The original vegetation within the City of Santa Clara was first modified by agriculture. Today the City is an urban environment where the habitat is limited by the type of land development.

**5.3.1 Flora**

Urban trees provide protection from climate extremes and fill the physical environment with vitality and beauty. Street trees unify the face of the street where there are diverse functions or facades, and they separate pedestrians from autos, both physically and psychologically. Planners, landscape architects, and traffic engineers have observed that motorists tend to drive more slowly on tree-lined streets.

Several streets in the City have extensive landscaping, including El Camino Real, Great America Parkway, Mission College Boulevard, Scott Boulevard, Tasman Drive, and Saratoga Avenue.

Vegetation associated with urban development in the City is mostly ornamental. The City has a street tree program which provides a tree for each single family lot. The specie emphasis in this program has been on smaller trees that do not require extensive maintenance and do not damage sidewalks. These smaller trees, however, do not provide the shade and visual impact of larger varieties.

Trees large enough to create a leaf canopy above streets and parking areas have a substantial impact on the immediate environment. The canopy intercepts a large amount of solar heat during the day. Water vapor given off also absorbs solar radiation and lowers the surrounding temperature. In general, an extensive tree canopy will moderate temperature extremes and winds.

The urban vegetation found in the City of Santa Clara varies greatly: tree grove, street strip, shade tree / lawn, lawn, and shrub cover. Drought tolerant plantings and water efficient landscape designs are encouraged throughout Santa Clara.

### **5.3.2 Fauna**

The natural landscape of the Santa Clara Valley floor was comprised of grasslands, savannahs, and salt and freshwater marshes which had supported a large amount of wildlife habitat of immense variety. The animal life was comprised of elk, deer, rabbits, bald eagles, geese, ducks, seabirds, grizzly bears, coyotes, and other game. As the original vegetation was replaced, the range of wildlife was reduced and is nearly eliminated within the City of Santa Clara. Native species have been supplanted by species which are more compatible with an urbanized area.

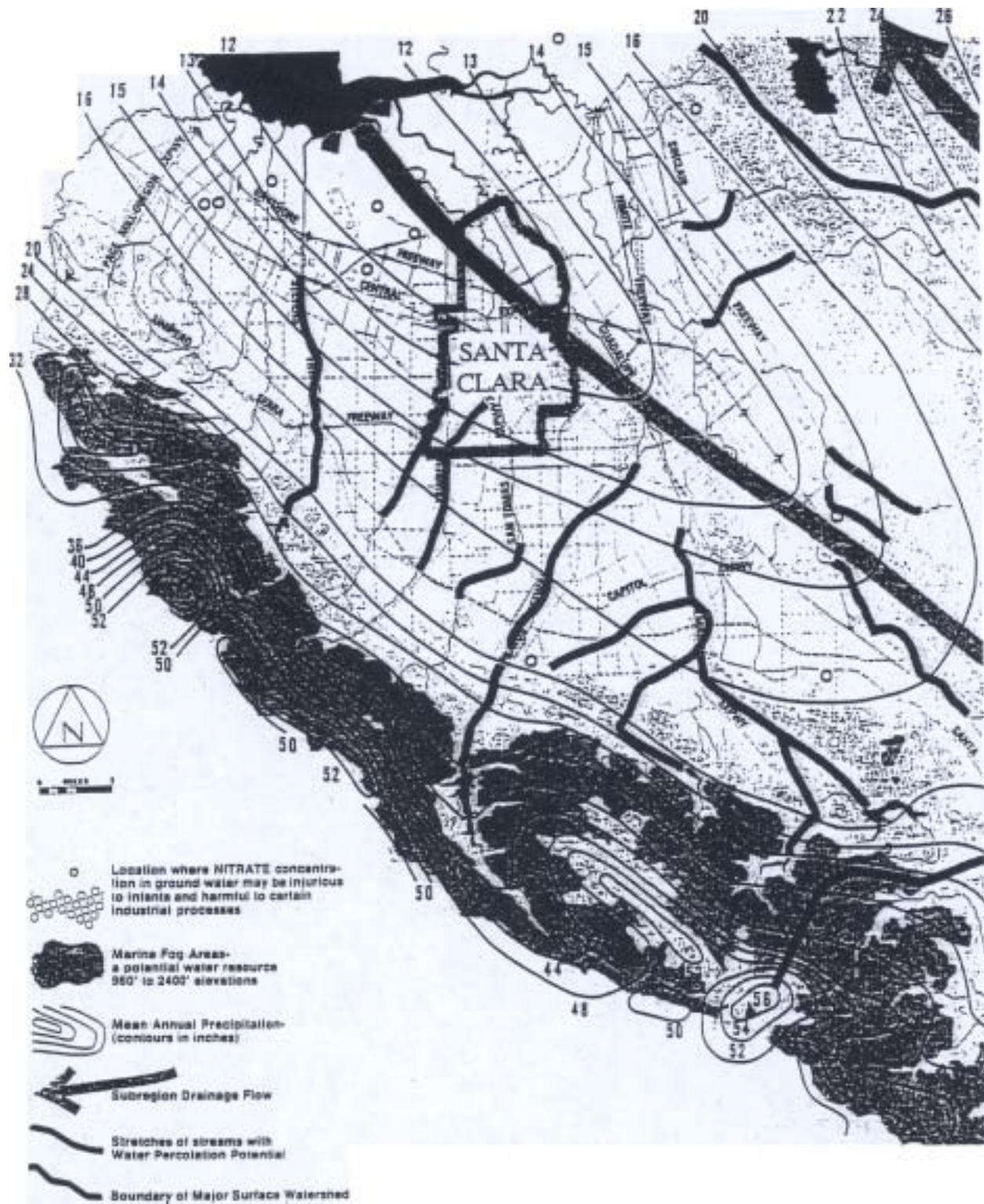
### **5.3.3 Endangered and Threatened Species**

An inventory of natural vegetation, fish and wildlife and their habitats within the City shows there may be endangered and threatened species as designated by Federal and State agencies. This list is included in Appendix to this General Plan.

The absence of a special animal, plant, or natural community from the endangered and threatened species and candidate species list does not mean that they are absent from the City of Santa Clara. The occurrence of special species or natural communities (flora and fauna) in the vicinity of the City may be an indication that they would also occur within the City itself.

Figure 5-D:

**WATER RESOURCES**



## **5.4 WATER RESOURCES**

The Santa Clara Valley Water District is a local public agency responsible for Santa Clara County's water supply and flood control needs. The District has responsibility for flood control, importation of water, groundwater recharge, and water treatment and distribution within the geographic area of the District, which includes the City of Santa Clara. Santa Clara Valley Water District's facilities and programs provide the County with high-quality drinking water and protection from flooding.

The water supply available to the City of Santa Clara can be divided into the following classifications: groundwater, imported water from San Francisco's Hetch-Hetchy system, and imported water from the Santa Clara Valley Water District, all of which are used for potable water purposes, and reclaimed wastewater, which is used for certain permitted landscape irrigation and construction purposes. Until the mid-1960s, groundwater was the City's sole source. In 1965, the Santa Clara Valley Water District began importing water into the Santa Clara Valley. The District uses this imported water for local groundwater recharge and, in 1967, began treating a portion of it for direct resale to various retail water agencies within the county. The City of Santa Clara is one of the retailers of this treated water.

### **5.4.1 Background**

Water use increased from 2,995 million gallons (MG) in 1959-1960, to 5,743 MG in 1970-1971 and 10,279 MG in 1984-1985. Usage for 1988 was 10,005 MG. Annual water production is estimated to be 10,335 MG in 1990 and 12,000 MG in 2005.

The City's surface area is approximately 19.3 square miles. During 1988, land use was: 46% residential, 37% commercial and industrial, and 17% public. Water use for that year was: 47% residential, 46% commercial and industrial, and 7% public. Normally, 30% of the City's water is treated surface water purchased from the Santa Clara Valley Water District and from San Francisco's Hetch-Hetchy system. The remaining 70% is pumped from the City's 28 wells.

### **5.4.2 Groundwater**

The groundwater basin over which the City is located comprises the largest of three interconnected groundwater basins in Santa Clara County. This basin is comparable to a large underground reservoir.

Hydrologically, the Santa Clara Valley groundwater basin is separated into two zones: the "forebay" and "pressure" zones. Geological conditions in the forebay zone allow precipitation, stream flow, and water diverted into percolation ponds to enter and "recharge" the deeper aquifers. The pressure zone includes areas of the valley where impervious and generally continuous clay strata overlie the major groundwater aquifers. The City of Santa Clara lies entirely within the pressure zone. The groundwater aquifers in the pressure zone are the most productive in the valley and the source of most groundwater extraction.

As a result of urban development and the corresponding increase in water demand, a long-term overdraft of the groundwater has occurred. This long-term overdraft has resulted in the lowering of the groundwater table and compaction of certain aquifers. It

also caused significant land surface subsidence in the northern part of the Valley, including north Santa Clara. Some groundwater aquifers are actually below the level of San Francisco Bay. However, impervious clay strata have prevented salt water intrusion into these aquifers. In recent years, records indicate that groundwater levels have improved due to importation of water and groundwater recharge, and are currently in equilibrium.

The amount of groundwater that can be withdrawn without causing a recurrence of land surface subsidence is called the "safe yield", and is dependent upon many factors, including the quantity of water available for recharge and the efficiency of the recharge program. There is now sufficient experience to estimate the safe yield of the basin. The City in 1991 is at safe yield limits and in the future will meet increased water requirements by placing more reliance on imported water.

The Santa Clara Valley Water District prepares an annual survey of Santa Clara County groundwater basin conditions. Based on the District's groundwater reports, it appears the annual safe yield of the Santa Clara Valley groundwater basin is between 137,000 and 169,000 acre feet. The City expects to pump 24,600 acre-feet of groundwater during 1990 (compared to 24,100 acre-feet in 1984-1985). It is likely that 24,600 acre feet will be the allowable annual limit on groundwater available for use by the City, based on the safe yield of the groundwater basin.

#### **5.4.3 Santa Clara Valley Water District Imported Water**

The Santa Clara Valley Water District has eight local reservoirs with a capacity of 155,000 acre-feet. These reservoirs collect local run-off during the winter storms for later release to percolation ponds. From these ponds, water percolates and recharges the underground aquifers. In addition to local run-off, water imported from the State Water Project and the United States Bureau of Reclamation's Central Valley Project is also utilized to recharge the underground water basin.

In 1990, the City of Santa Clara received about 15 percent of its water supply from the District's treated water distributary through a connection located at the Serra Water Storage Tank site near the intersection of Stevens Creek Boulevard and Interstate Route 280. This connection was designed for a maximum flow of approximately 4,000 gallons per minute (GPM). For the City to utilize more than 4,000 GPM would require repumping some of the water, modification of the City's storage and transmission system, and expansion of the District's Rinconada Water Treatment Plant.

#### **5.4.4 City of San Francisco's Hetch-Hetchy System**

The City of San Francisco obtains water from the Tuolumne River watershed in the Sierra Nevada mountains, Calaveras Reservoir in Alameda and Santa Clara Counties, and from Crystal Springs Reservoir on the San Francisco Peninsula.

Water from the Sierras and from Calaveras Reservoir is delivered by the Hetch-Hetchy Aqueduct. A branch of this aqueduct traverses the northern portion of the City of Santa Clara.

The City has two connections to the Hetchy-Hetchy system, with a combined capacity of 7,500 GPM. These connections feed directly into the City's distribution system at sufficient pressure to avoid the need for pumping. The City can also store Hetch-Hetchy water in

the Northside Storage Tanks for later repumping into the water distribution system.

The City's maximum contract limit for this source is 6.57 million gallons per day.

The current water supply contract between the City of Santa Clara and the City of San Francisco is temporary and interruptible. If an interruption of water supply to the City is required, two years advance notice by San Francisco will be given. Further, if an interruption of service is necessary to reduce annual supply, then the interruptions to the City would occur only in non-peak-use months.

#### **5.4.5 Future Water Needs**

Since groundwater withdrawals by the City of Santa Clara have already reached the maximum safe yield, the City must rely on imported treated water, use of reclaimed water and conservation to meet increased water demands. One alternative would be for the Santa Clara Valley Water District to provide a treated water connection to north Santa Clara from a project similar to the San Jose Distributary line shown on the District's Master Plan in the 1970s, but now deleted. The City's expected future growth will occur primarily in its northerly part.

#### **5.4.6 Wastewater Reclamation**

Wastewater reclamation has been the subject of studies by individual dischargers and has resulted in reclamation projects.

An important means of conserving the City's Water Supply is to provide reclaimed water for those uses where non-potable water is suitable. The reclaimed water supply available to the City is the filtered and treated effluent from the San Jose/Santa Clara Water Pollution Control Plant.

The City has recently completed a reclaimed water distribution pipeline capable of delivering 2500 GPM or 3.6 MGD. This pipeline provides irrigation water to the municipal golf course at two points, one on the east side of Lafayette Street and the other at Great America Parkway just south of Old Mountain View Road. The next phase will extend the pipeline in Lick Mill Drive south of Tasman Drive to serve median landscape irrigation and the new City park planned for that area.

Although a few specific applications of this water have been permitted thus far (for golf course irrigation, certain construction uses and municipal maintenance), other uses of reclaimed wastewater, including general landscape irrigation, must be approved by the California Regional Water Quality Control Board.

The incentives for prospective customers to utilize reclaimed water include: lower unit cost for water; supply in times of drought; and, for some industrial uses, a higher quality water than their current supply. The disincentives include: more stringent regulations on the time and place of water use; requirements for public notification; and landscape soil amendments to counteract the accumulation of dissolved salts and minerals.

#### **5.4.7 Water Conservation**

Droughts in California are a fact of life, and no one is yet able to predict when droughts will begin or how long they will last. Water conservation can serve as a substitute for new

water supplies by saving existing water for new users. The City of Santa Clara is promoting efficient water use through landscape design and management. Other conservation efforts include public education programs, presentations at local schools and organizations, mailing water conservation suggestions with water bills, distribution of water conservation kits, and regulation of water waste through adoption and enforcement of appropriate water use regulations. Future measures might include water pricing structures that encourage better water management practices.

## **5.5 WATER QUALITY**

### **5.5.1 Drinking Water Regulations**

The quality of drinking water is vigorously regulated by the Federal Government. In 1974, Congress passed the Safe Drinking Water Act which required the Environmental Protection Agency (EPA) to establish uniform standards for drinking water. The Safe Drinking Water Act was amended in 1986, adding even more stringent standards. In California these standards are enforced by the California Department of the Health Services.

There are two types of drinking water standards. Primary Standards are designed to protect public health. These standards specify the maximum contaminant levels for substances in water that may be harmful to humans or affect their health if consumed in excess. Secondary Standards are based on aesthetic qualities of water such as taste, odor or clarity. These standards specify limits for substances that may affect consumer acceptance of the water.

In addition, the State of California sets Action Levels to limit public exposure to substances not yet regulated by federal standards.

The City of Santa Clara is committed to providing a safe and reliable supply of high quality drinking water. The Annual Water Quality Report published by the City of Santa Clara contains the latest laboratory test results, and answers the most common water quality questions asked by customers.

Under the City's water testing program, a vast array of water quality factors, including coliform bacteria, taste, odor, color, clarity, hardness, minerals, radionuclides, and organic and inorganic chemicals, are tested on a regular basis. Every month, more than 100 water samples are tested by a State-certified laboratory using the most sophisticated equipment and up-to-date testing procedures. These tests have always shown that the City of Santa Clara's water not only meets, but surpasses all existing safe drinking water standards.

### **5.5.2 San Francisco Bay Water Quality Issues**

The State Water Resources Control Board, through its nine Regional Boards, has the responsibility to ensure the protection of water quality and allocation of water rights. Each region develops a Basin Plan which provides the basis for a Region's entire regulatory and enforcement program, and addresses major issues including wetland protection, toxicity control, urban runoff management, and dredging. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) was revised and adopted by the San Francisco Regional Water Quality Control Board in 1986, and approved by the State Water

Resources Control Board in September 1987.

Water quality in Santa Clara is critical to San Francisco Bay. All surface waters in the area flow into the southern portion of the Bay where there is a low capacity to absorb pollutants. Pollutants could enter local waters from three sources: runoff, sewage treatment plant, and landfill areas.

Runoff is the least controlled of the three, travelling freely from streets, parking lots and roofs to storm drains and into streams. In the Bayshore North area, some of the runoff is collected in retention basins where some form of detention or treatment may be possible. Recent studies indicate that storm water runoff contains pollutants that affect water quality of the Bay. The City's Street Department and the County's Health Department monitor certain discharges as required by law. In addition the cities, County and Santa Clara Valley Water District have developed an area-wide Nonpoint Source Pollution Control Program which uses the best practical measures to reduce pollutants in storm water runoff.

A Regional Water Quality Control Board review of a study submitted by the South Bay Dischargers Authority (SBDA) in 1989 raised concerns that San Jose/Santa Clara's highly treated wastewater has caused the conversion of saltmarsh to fresh water and brackish marsh, thereby reducing the habitat of two endangered species, the California clapper rail and the saltmarsh harvest mouse.

Potential contamination by seepage from sanitary landfill was a major issue in the Board's granting a permit for the City's expanded landfill operation. The Water Quality Control Board required special engineering of the site to ensure that liquid pollutants would be contained within the fill.

## **5.6 FLOODING**

The four streams that run through the City, Saratoga Creek, San Tomas Aquino Creek, Calabazas Creek, and the Guadalupe River, carry water from their watershed areas to the Bay. Development in the watershed and on the Valley floor has substantially increased the amount of runoff carried by these streams and the damage potential of floods. In 1974, the Federal Government identified the flood prone areas of the City (areas subject to a one percent chance of flooding in a year). For more information, see the 100 Year Flood Hazard Zone Diagram.

The Santa Clara Valley Water District is responsible for flood control of the streams within Santa Clara. To accommodate the increasing runoff and past subsidence, the District has been widening and straightening the channels and constructing levees. These modifications have changed the character of the streams from natural creeks to flood control channels, some lined with concrete or rock gabion.

The flood prone areas occur in low lying land between the stream levees. In Santa Clara, this situation occurs mainly in the area north of the Bayshore Freeway. The City has developed a master drainage plan for this area which will collect local runoff in two retention basins and at several other pump stations from which it will be pumped over the levees into the streams.

Adding to the flood problem in the northern-most portion of Santa Clara is the potential salt water inundation. This land is below the extreme high tide elevation of San Francisco Bay (10 feet mean sea level). This problem has been alleviated by raising the levees and the construction of Route 237 as a dike between the Baylands and the City of Santa Clara.

The City has joined the Federal Flood Insurance Program and is working with the Federal Government and other agencies, including the Santa Clara Valley Water District, to reduce the potential for damage from floods up to the 100 year event (the flood which has a one-percent chance of occurring in a given year). Shallow depth of flood waters and low velocities of flow within the City of Santa Clara will minimize the damage from flooding.

The City's newest subdivisions provide storm sewers capable of carrying runoff from a 10-year flood. Runoff in excess of the 10-year flood will be carried in the streets. Building pads have been elevated above street level to substantially reduce the amount of property damage experienced in a major flood. The City has identified several drainage projects which will provide a 10-year storm flow capacity throughout the City.

Figure 5-E:

**100 YEAR FLOOD HAZARD ZONE**



## **5.7 HAZARDOUS MATERIALS**

"Hazardous materials" is any substance that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. This includes, but is not limited to, hazardous substances and hazardous wastes.

Industry is the greatest generator of hazardous waste. Industries typically use or generate significant volumes of solvents, organic liquids, metals in liquid solutions, and organic sludges and solids. At the other end of the scale, thousands of households generate hazardous waste through the use of household products, pesticides, solvents, and used motor oil. Two other sources of hazardous waste are from leaking underground tanks and contaminated sites. The proper handling, disposal, and clean-up of hazardous materials are priorities in the City of Santa Clara.

Updated copies of the Hazardous Waste and Substances Sites List are regularly provided to the City of Santa Clara Planning Division by the State of California, Office of Permit Assistance. The data for the list is received from the State Water Resources Control Board, the California Waste Management Board and the State Department of Health Services.

### **5.7.1 Santa Clara County Hazardous Waste Management Plan**





In 1986, the "Tanner Bill", State Assembly Bill 2948, established the process by which California counties develop Hazardous Waste Management Plans.

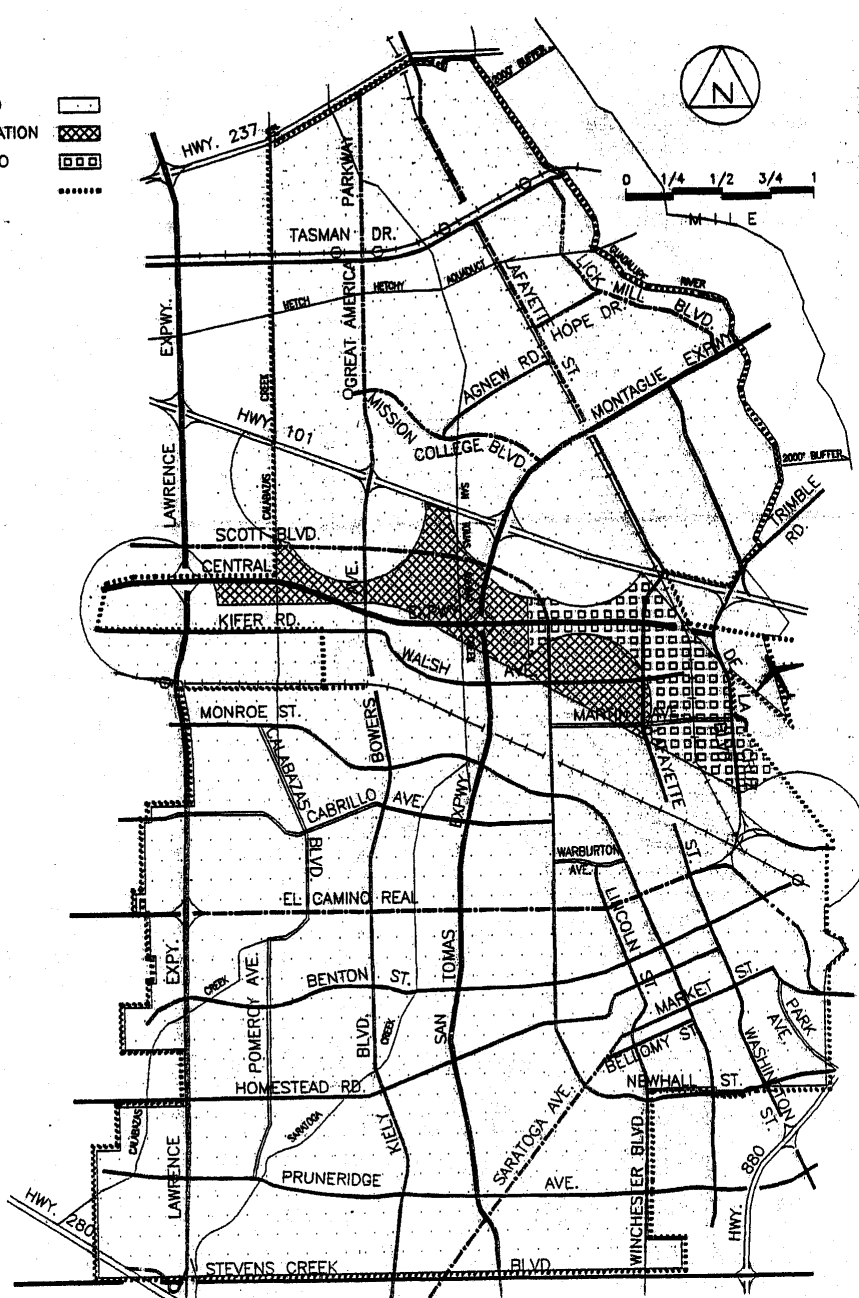
The Santa Clara County Hazardous Waste Management Plan as it pertains to the City of Santa Clara is hereby adopted and incorporated in this General Plan by reference. The goals of the Plan are to establish a system for managing hazardous materials, including wastes, to protect public health, safety and welfare and maintain the economic viability of the County and the State. The Plan is intended to provide the public, industry, and local government with information to take appropriate steps to minimize, recycle, treat, dispose, and otherwise manage hazardous wastes.

Figure 5-F:

**HAZARDOUS WASTE SITING CONSTRAINTS**

**LEGEND**

- SITING RESTRICTED 
- SITING WITH MITIGATION 
- SITING SUBJECT TO CITY APPROVAL 
- CITY LIMIT LINE 



### **5.7.2 Hazardous Waste Siting Constraints**

The City closely monitors the location and handling of hazardous material, including hazardous wastes. Consistent with the County Hazardous Waste Management Plan, the City has adopted standards for review of Hazardous Waste Management Facilities, along with a Hazardous Waste Siting Constraints Diagram which indicates those industrial areas appropriate for consideration of siting of such facilities. Sites outside of those areas shown on the diagram will not be considered for permanent siting of hazardous waste facilities, due to existing or potential environmental constraints and inconsistency with the Policies and Programs of this Plan. Areas with General Plan land use designations of Light or Heavy Industrial are appropriate for hazardous material, chemical treatment or transfer points if potential adverse impacts are mitigated as part of conditional approval.

An example of an area not considered appropriate for siting or expansion of manufacturing uses which use hazardous materials is the area north of the Bayshore Freeway, near the Tasman Light Rail line. The City anticipates increases in the number of people using the Light Rail Line, going to the Convention Center, Great America Amusement Park, Mission College Campus and other destinations.

## **5.8 NOISE**

The Noise Section of the Environmental Quality Element relates most directly to the Land Use and Transportation Elements of this plan. The Noise Section identifies noise issues that develop between land uses and their environment or result from transportation facilities, and suggests ways to address them.

The problem of noise has worsened rapidly as our society has become mechanized and urbanized. Freedom from excessive noise is one measure of the quality of life. Noise is defined as unwanted sound. Sounds become unwanted when they disrupt the ability to talk, listen, learn, work, relax or sleep. Basic types of noise are: 1) Ambient Noise - A relatively steady background noise which is an accumulation of different noise sources most of which are transportation related. 2) Single Event Noise - An unusual, occasional or temporary noise such as loud music, construction work or ambulance siren. 3) Operational Noise - A continuous or frequent noise related to the use of property such as heating and cooling systems and business activities occurring at loading / delivery docks.

Noise can create both physical and psychological effects through annoyance and disruption of sleep, relaxation, and concentration. Santa Clara is an urban area, the City is working toward reasonable reduction of the adverse effects of excessive noise on its residents and maintenance of acceptable noise standards.

Figure 5-G:

**NOISE AND LAND USE COMPATIBILITY (Ldn & CNEL)****LEGEND**

COMPATIBLE.



REQUIRE DESIGN &amp; INSULATION TO REDUCE NOISE LEVELS.



INCOMPATIBLE. AVOID LAND USE EXCEPT WHEN ENTIRELY INDOORS AND AN INTERIOR NOISE LEVEL OF 45 Ldn CAN BE MAINTAINED.



HEARING DAMAGE POSSIBLE WITH LONG TERM EXPOSURE.

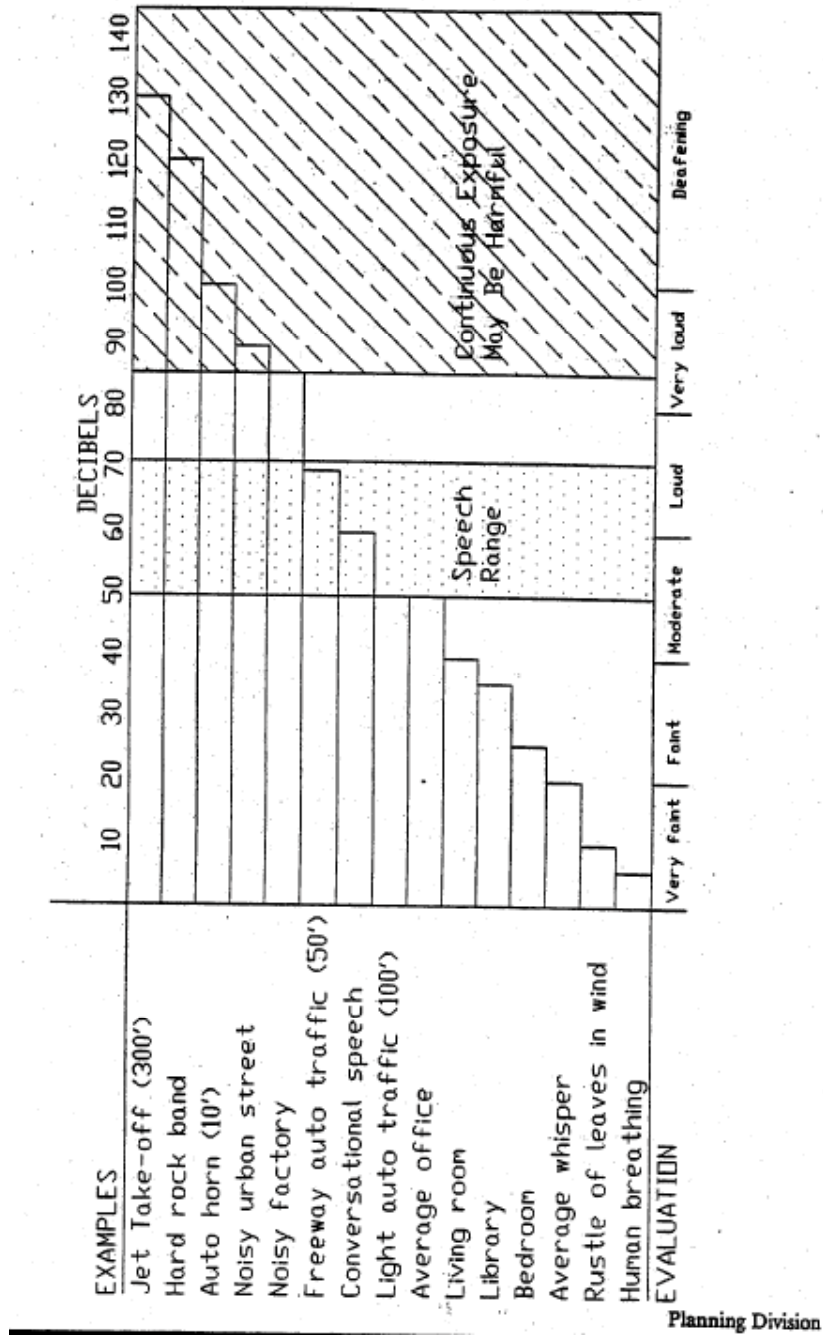


Ldn & CNEL	50	55	60	65	70	75	76	80	85
RESIDENTIAL	COMPATIBLE	COMPATIBLE	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE
PUBLIC-EDUCATIONAL	COMPATIBLE	COMPATIBLE	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE
RECREATIONAL	COMPATIBLE	COMPATIBLE	COMPATIBLE	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE
COMMERCIAL	COMPATIBLE	COMPATIBLE	COMPATIBLE	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE
INDUSTRIAL	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	REQUIRE DESIGN & INSULATION TO REDUCE NOISE LEVELS	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE
OPEN SPACE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	INCOMPATIBLE	INCOMPATIBLE	INCOMPATIBLE

Planning Division 3/91

Figure 5-H:

**COMMON SOUNDS IN DECIBELS**



### **5.8.1 Measurement of Noise**

Sound is the result of the vibration of an object which is transmitted through the air in waves which in turn vibrate the ear drum. Sound is measured in units called decibels (dB).

Since the human ear does not hear all sounds equally, a special weighted decibel measurement (dBA) is used to simulate human hearing.

Acceptable levels of noise vary from land use to land use. Also, in any one location, the noise level will vary over time, from the lowest background or ambient levels to that of passing airplanes or construction equipment. Various techniques have been developed which measure the effects of noise levels over a period of time.

State and Federal Standards have been established as guidelines for determining the compatibility of a particular use with its noise environment. Federal laws and policies typically control noise levels for civilian aircraft, military aircraft operations and noise levels of trains. All other noise regulations have been generally delegated to the States and local governments to implement and enforce.

The State of California utilizes a measurement scale called "Community Noise Equivalent Level" (CNEL) which places a weighted factor on sound events occurring in the evening or nighttime hours. A similar measure promoted by the Federal Environmental Protection Agency is called "Day-Night" (Ldn).

The City can control noise through local land use and transportation planning. Decisions about the type, location and intensity of land uses affect the amount of noise generated and the extent of the impact. Decisions about roadway location, design, capacity and traffic management methods have similar implications.

Extremely loud noise experienced over a long period of time can cause deterioration of hearing. Research has indicated that very low levels of noise can also have adverse effects. At the most common levels, noise can be a source of annoyance through interruption of periods of relaxation or concentration. These same noises at night can interrupt sleep. In schools, loud external noises can weaken the learning process by making speech difficult to understand. Over a long period of time, annoyance can become a psychological problem causing irritation and stress.

At the higher levels of noise, the ear will begin to take protective measures such as a temporary reduction in hearing sensitivity. Given enough exposure to such noise levels, the temporary insensitivity can become permanent hearing loss.

Typically, decibel level changes of 1 dB cannot be distinguished, a 3 dB change is just noticeable, a change of 5 dB is distinct and a change of 10 dB is perceived as a doubling of noise (e.g., between 50 and 60 dB).

### **5.8.2 Major Noise Sources**

The most widespread and continual sources of noise in Santa Clara are the transportation facilities. Unfortunately, in terms of improving the noise environment, these same facilities are those over which City has the least control.

**(a) Freeways and Expressways**

A moving car has a number of noise sources; the engine, the exhaust, the tires in contact with the road, and air passing by the car. All of these tend to increase with higher speeds. As a result, those roads with the most cars and the highest average speeds are the strongest sources of noise. The network of freeways and expressways in the City has an adverse noise impact on many homes.

The design and construction of these roads are controlled by either the State or the County. By depressing a road through a developed area, acceptable noise levels can be maintained on adjacent property. On expressways, the County has begun to build noise walls on residential property lines. Other factors such as pavement texture, gradient, and building orientation can be altered to minimize adverse effects.

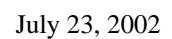
**(b) Local Arterials and Collectors**

Although the average speed and traffic volumes are not as high as on freeways and expressways, other major streets in the City are also sources of noise. Because houses normally face directly on these streets, the impact of the noise can be significant. Older homes are especially affected due to typically lower amounts of insulation. There are fewer opportunities to install noise barriers between the traffic and the houses. Keeping existing setbacks will help to mitigate street noise.

Given the existing high traffic volumes on nearly all major streets in the City, it is rarely possible to divert traffic from any major street without shifting the traffic noise problem to other residential streets. Residential uses located on interior streets (away from the grid network of major streets) are generally not exposed to these higher noise levels.

**(c) Airport**

The noise generated by the aircraft using the San Jose International Airport has a significant impact on the Santa Clara residents in the area north of the Bayshore Freeway. The City of Santa Clara uses the official Santa Clara County ALUC Referral Boundary (65dB CNEL) Map as a basis of referring proposed projects to the Airport Land Use Commission. The current ALUC Referral Boundary (65dB CNEL) Map is illustrated on the ALUC Referral Boundary (65dB CNEL) and Airport Safety Area Diagram.



The Santa Clara County Airport Land Use Commission has determined that the noise environment in this area is adverse enough to prohibit any significant new residential development. Such a policy may limit an increase in the number of people affected by the airport, but does not improve the living conditions of existing residences.

The technical design of aircraft and the San Jose Airport are determined by Federal, State and San Jose agencies. The City participates as a voting member on the Airport Land Use Commission. The City also participates in the Airport Master Plan Update and the Airport Noise Advisory Committee. This participation allows the City to review and comment on the impacts such as noise of the Airport on proposed projects and the impact of proposed Airport projects on the community.

A monitoring program has been established around the airport and flight patterns of commercial aircraft have been altered to minimize the amount of low altitude flying. This also includes helicopter flights in the area.

The State has also adopted legislation which requires that the noise levels from airports affecting residential uses be reduced over time. This law requires either that the noise be reduced or the residential uses relocated.

In parts of Santa Clara immediately north of the San Jose Airport, the City of San Jose has begun acquisition of residential uses to eliminate noise conflicts, i.e. areas where the noise levels are high enough to disrupt normal activities and possibly cause hearing damage over the long term. Elsewhere in the noise impact area, San Jose is developing an insulation program to reduce interior noise levels in existing homes and schools.

**(d) Railroads**

The Southern Pacific Transportation Company owns two rail lines through the City of Santa Clara. The San Francisco line forms the boundary between the residential area to the south and the industrial area to the north across the central portion of the City, and the other line parallels Lafayette Street northward from where it crosses under De La Cruz Boulevard. Operations on these lines include both passenger and freight service, with spur tracks within the industrial area. If rail activity increases, contiguous noise walls may be needed along the railroad right-of-way where it is immediately adjacent to residential uses.

**(e) Rapid Transit**

Transportation facilities in Santa Clara include rapid transit on fixed guideways (such as the Light Rail line) and flexible routes such as the County bus system. The noise impacts of the system should influence both the location of the routes and the operational design. Low noise alternatives such as undergrounding, light weight vehicles, and rubber tires, must be considered and balanced with other factors, such as cost and access.

**(f) Industry**

Industrial land uses involve a number of activities which have a potentially adverse noise impact. Many basic industrial processes such as fabricating, stamping,

pressing and grinding are extremely noisy. Peripheral activities such as loading and unloading, truck movements, and equipment like compressors also create noise. A basic goal of Santa Clara's General Plan has been the separation of industrial and residential uses to reduce noise conflict. Overall this policy has been effective; however, in the southwest corner of the City adjacent to Vallco Park and north of Bayshore in the De La Cruz industrial area, residential and industrial uses are immediately adjacent. In the past, both of these areas have been sources of complaints concerning industrial activities adjacent to residential areas, necessitating solid walls facing residences, and heavy landscaping of common property lines. Outside compressor units may need to be placed in soundproof enclosures to protect residential neighbors.

**(g) Fixed Noise Sources**

In areas outside industrial zones, permanent equipment has been the source of some noise complaints. The worst problems are typically refrigeration units, air conditioning units, and pool pumps. The City has a fixed noise source ordinance administered by the Planning Division and the Police Department which limits noise levels based on surrounding land uses.

The City can consider buying quieter equipment over time and encourage private business and residents to do so as well.

**(h) Short Term Noise Sources**

Temporary activities such as construction, parades, concerts, tree removal, and outdoor sports events are major sources of annoying noise. The fact that they are short in duration often means that the operator gives little thought to the resulting noise. Construction activities can last for several months and generate substantial numbers of complaints. Some are unavoidable, but new advances in muffling can reduce noise from jackhammers, portable compressors, and generators. The hours of a project's construction in residential areas are controlled by City Ordinance.

**(i) Interior Sources**

A chronic complaint of many apartment dwellers is the amount of noise from adjacent units. These noises include voices, stereo equipment, and the vibrations from dishwashers and garbage disposal units. Noise between apartment units is transmitted either as airborne sound which passes through the walls or as vibration sound travelling along pipes or structural members of the building. Prior to 1973, the Building Codes had no requirement for sound insulation. In 1973, the City adopted sound transmission criteria that substantially reduces the amount of noise that can pass through walls and floors of apartment units. Late night mobile noise complaints such as loud stereos are typically investigated by the City Police Department as to whether or not they constitute a nuisance.

**5.8.3 Noise Contours**

One way of describing the noise environment of the entire City is through a noise contour map. Similar to topographic maps, the lines on a noise contour map indicate areas of equal noise levels.

The noise contour map utilizes the day-night measurement scale (Ldn). For the range of values on the City's contour map, the CNEL and Ldn measurements are essentially the same (the actual reading would be within one decibel for either scale).

The noise contour maps indicate the importance of traffic and the airport in determining the noise environment of the City. The quietest areas of the City are those furthest from major City streets. The noisiest areas are under the airport pattern and immediately adjacent to freeways. The contours of existing and future noise levels were developed based on 1990 and projected year 2005 traffic volumes. It was assumed that the noise levels generated by the San Jose Airport would not change significantly between now and 2005, i.e. increases in air traffic should be offset by the new quieter Stage 3 jet engines increasingly being used by the airlines.

#### **5.8.4 Noise Sensitive Areas**

In addition to uses which cause noise problems, there are uses that are particularly sensitive to noise. Sensitive uses include sleeping, convalescence and teaching. The residential sites, educational and medical facilities are the sensitive areas of the City.

Where a noise source and a highly sensitive area overlap, the potential for noise conflict is greatest. In Santa Clara, primary noise sensitive areas are: 1) Agnews Hospital, the surrounding residences and elementary schools, all of which are under the airport flight path; 2) residential developments along the railroad lines and Lawrence and San Tomas Expressways; 3) the Mission Campus of the West Valley College; and 4) residential uses adjacent to industrial property.

#### **5.8.5 Methods of Reducing Noise Conflict**

The perception of noise involves a source, a transmission phase or path, and a receiver. The sequence can be interrupted at any of the three points and the noise impacts reduced.

**Figure 5-J:**  
**1990 TRAFFIC NOISE LEVELS (dNA, CNEL) – NORTH SANTA CLARA**

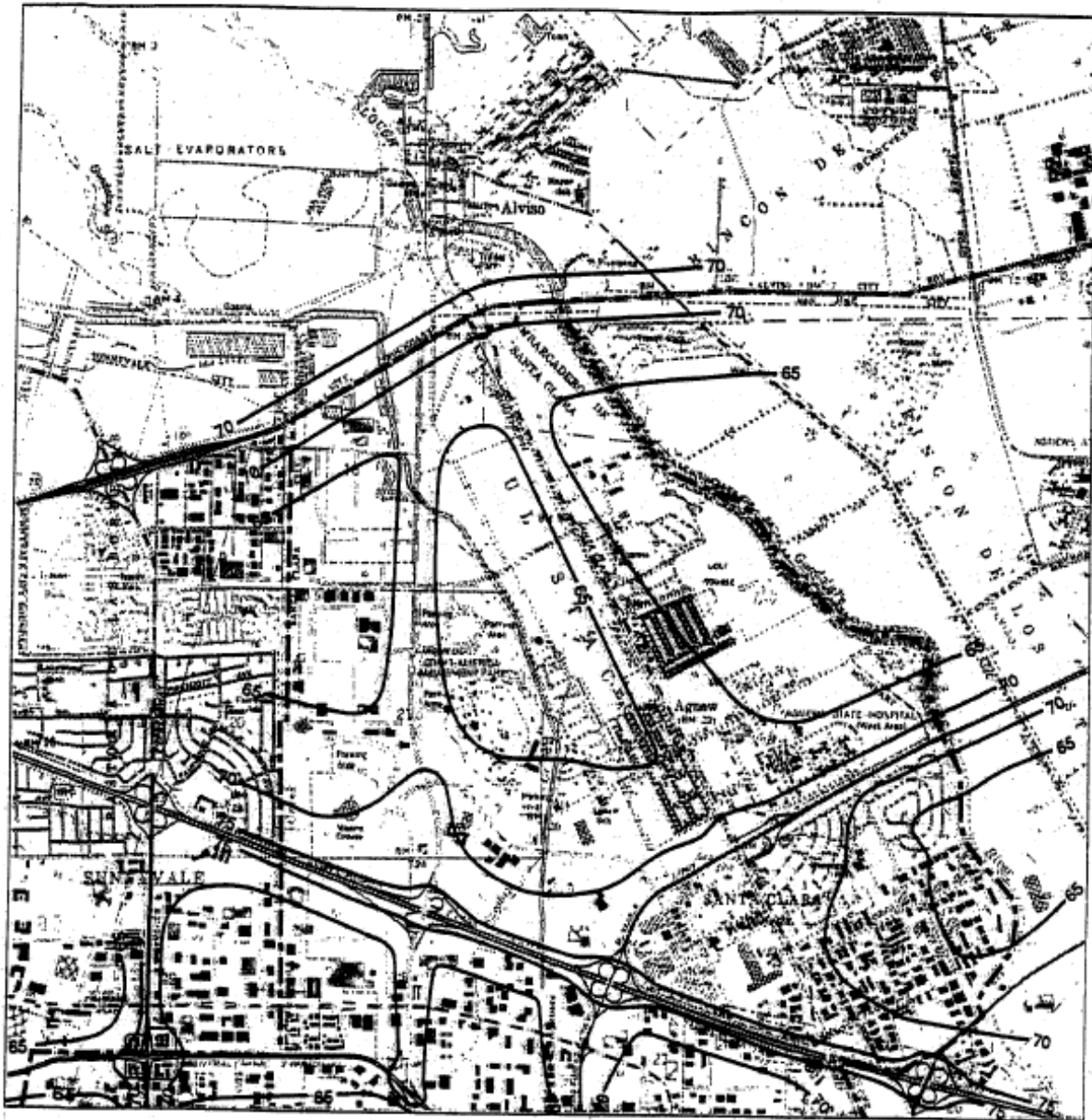


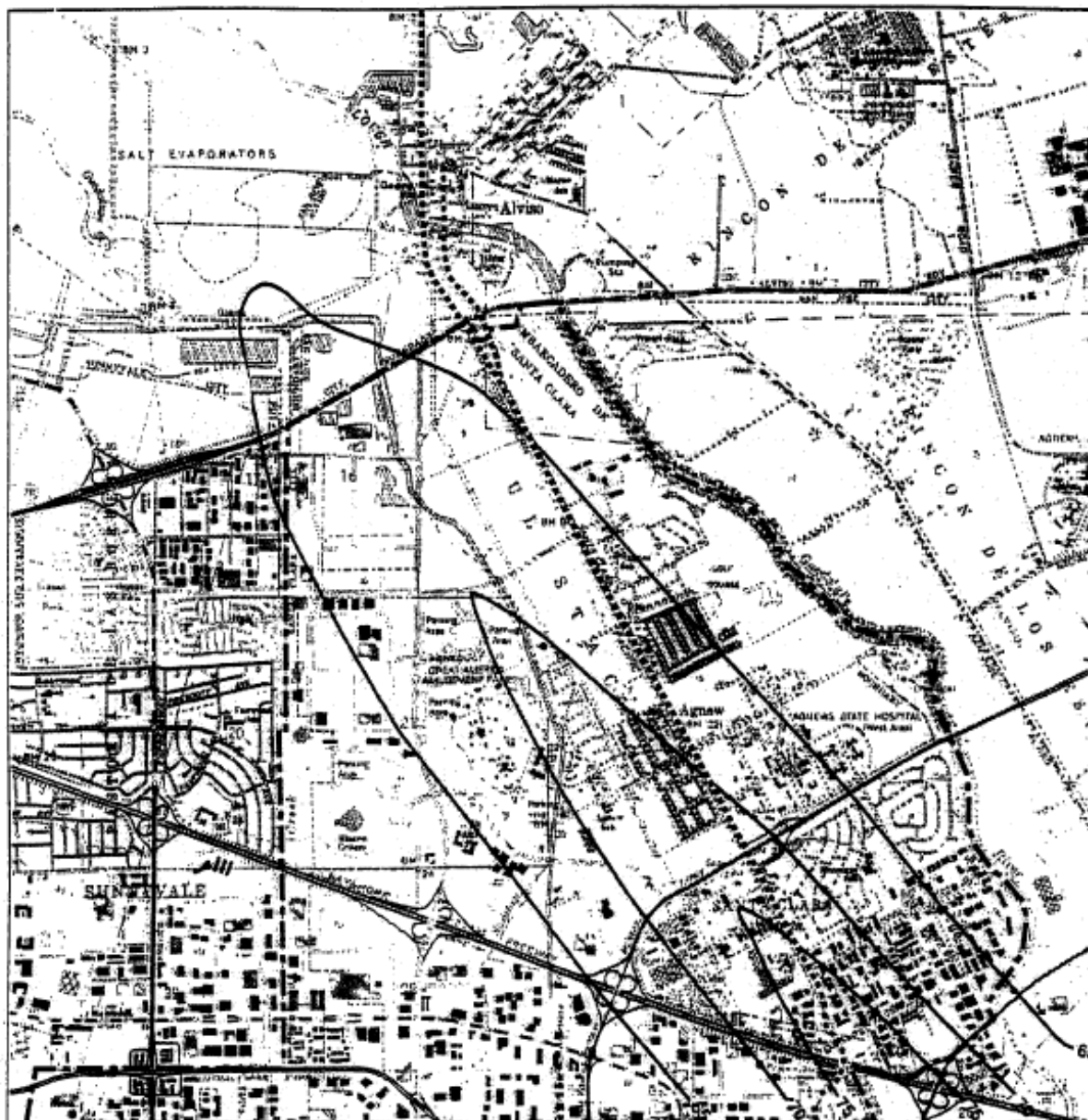
Figure 5-J:

1990 TRAFFIC NOISE LEVELS (dNA, CNEL) – SOUTH SANTA CLARA



**Figure 5-K:**

**1990 RAILROAD AND AIRPORT NOISE CONTOURS (dBA, CNEL) – NORTH SANTA CLARA**



..... The 60 dBA noise contour along the Southern Pacific Oakland freight line is estimated to be 80' from the tracks.



**Figure 5-K:****1990 RAILROAD AND AIRPORT NOISE CONTOURS (dBA, CNEL) – SOUTH SANTA CLARA**

Note: .....The 60 dBA noise contour along the Southern Pacific / CalTrain Peninsula Commuter Line is estimated to be 165 ft. from the tracks.  
 ----- The 60 dBA noise contour along the Southern Pacific Oakland freight line is estimated to be 80' from the tracks.

Figure 5-L:

**2005 TRAFFIC NOISE LEVELS (dBA, CNEL) – NORTH SANTA CLARA**



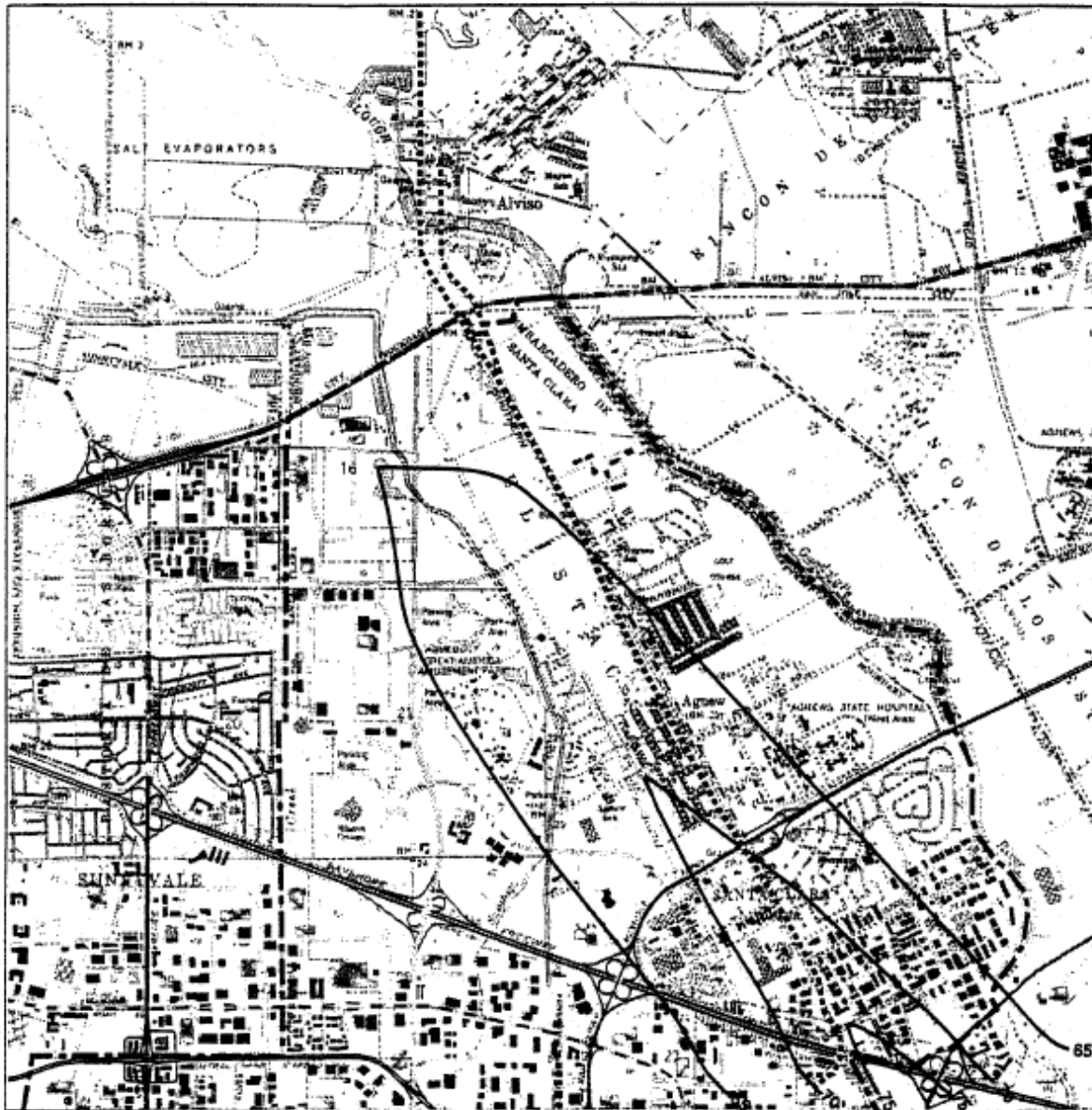
Note: .....The 60 dBA noise contour along the Southern Pacific / CalTrain Peninsula Commuter Line is estimated to be 165 ft. from the tracks.  
----- The 60 dBA noise contour along the Southern Pacific Oakland freight line is estimated to be 80' from the tracks.

Figure 5-L:

**2005 TRAFFIC NOISE LEVELS (dBA, CNEL) – SOUTH SANTA CLARA**



**Figure 5-M:**  
**2005 RAILROAD AND AIRPORT NOISE CONTOURS (dBA, CNEL) – NORTH SANTA CLARA**



Note: ..... The 60 dBA noise contour along the Southern Pacific Oakland freight line is estimated to be 80 ft. from the tracks.



**Figure 5-M:**  
**2005 RAILROAD AND AIRPORT NOISE CONTOURS (dBA, CNEL) – SOUTH SANTA CLARA**



Note: ..... The 60 dBA noise contour along the Southern Pacific Oakland freight line is estimated to be 80 ft. from the tracks.



A noise source can be controlled through regulation such as a noise ordinance or through muffling techniques which reduce the amount of sound emitted.

The transmission path can be interrupted through the creation of a buffer between the source and the receiver, such as a noise wall, earth embankment, or building.

The receiver can be protected from the noise impacts through insulation, building orientation, shielded areas, or the wearing of earplugs. Through zoning regulations that separate conflicting uses and building design review that ensures appropriate orientation, shielding, and insulation, noise impact on the receiver can be minimized. Conventional residential building design will reduce interior noise levels by approximately 15 dB. Floor plans can be arranged to orient sensitive bedroom and living room areas away from noise sources. Kitchens and bathrooms can also be noise buffers. Further measures may be required in higher noise areas in order to create an acceptable interior noise level.

#### **5.8.6 Noise Standards**

In order to avoid the problem of having to judge noise simply on one person's complaint, noise standards must be established which reflect a City-wide judgement. Decisions can then be made based on whether a particular use is incompatible with the existing noise levels.

The U.S. Environmental Protection Agency has identified those noise levels which interfere with important human activities like sleeping and speech and the noise level which can result in permanent hearing damage. Studies have indicated that a noise environment of 40 Ldn will permit 100 percent hearing of speech. Since the typical house provides an outside to inside noise reduction of 15 dB, the maximum exterior noise level that doesn't interfere with speech is 55 Ldn.

The indoor, evening noise level associated with 55 Ldn is 32 dB, which is "consistent with the limited available sleep criteria."

A noise level of 76 Ldn has been identified as the maximum allowable level for protection against hearing loss, based on eight-hour, working day exposure converted to a year round, day-night scale. There are locations in the City where this critical level is reached; immediately under the airport pattern and adjacent to each of the three freeways.

With these two noise levels as a starting point, a Noise and Land Use Compatibility chart has been prepared as a guide for noise related decisions. Because many areas of the city currently exceed the standards, particularly residential and educational uses, the chart must be considered as an objective towards which the City continues to work. The City will continue to enforce the City's Noise Ordinance, participate in the Airport Noise Advisory Committee, and employ other measures to promote satisfactory noise levels in the community.

### **5.9 AIR QUALITY**

Air pollution is a significant environmental problem facing the City of Santa Clara and most of the Bay Area. Air pollutant concentrations are determined by the amounts of pollutants emitted and the degree to which these pollutants are diluted in the atmosphere.

Ambient air quality standards were established in California starting in 1969 pursuant to the Mulford-Carrell Act, and at the Federal level after the passage of the 1970 Clean Air Act. Smoke, dust, and various chemical compounds recognized years ago as air pollutants have been studied and documented. Recent studies indicate that local air pollution can have cumulative global effects, such as the impacts from chlorofluorocarbons on the earth's ozone layer.

### **5.9.1 Climate**

The Bay Area climate is characterized by moderately wet winters and dry summers. Winter rains which occur in the months of December through March account for about 75 percent of the average annual rainfall. During rainy periods pollution levels are low.

In summer the northwest winds are drawn into the interior through the Golden Gate and over the lower portions of the San Francisco Peninsula. This channeled wind flow sweeps southeast, producing northwest winds in Santa Clara. Low wind speeds (a result of the sheltering effect of the surrounding terrain) contribute to high concentrations of emitted pollutants. Light winds occur most frequently during fall, winter, early morning and night time periods. Commute traffic peaks occur in the early morning and late afternoon / evening during the highest frequency of low wind speeds. These are the periods of heaviest air pollution.

At the same time, temperature inversions can occur which limit the amount of vertical mixing of air and thus trap pollutants in the lower atmosphere where people breathe. Inversions are characterized by a layer of warmer air above a layer of cooler air.

Smog is not emitted directly into the environment, but is formed by complex chemical reactions in the atmosphere between oxides of nitrogen and reactive organic compounds or reactive hydrocarbons, in the presence of sunlight. The inland valleys of the Bay Area and especially Santa Clara Valley are prone to high summer temperatures and abundant sunshine (smog-making conditions). Ozone formation is greatest on warm, windless, sunny days. Santa Clara Valley is thus prone to the formation of photochemical pollutants if the proper chemical ingredients are provided.

### **5.9.2 Topography**

The mountains surrounding the valleys of the Bay Area are responsible directly or indirectly for much of the high pollution potential of some areas. The horizontal dilution resulting from the meandering of wind flow currents is restricted by the sheltering terrain of the Bay Area, and thus the concentrations of pollutants are higher than they would be if the terrain were flat.

### **5.9.3 Health Effects and Sources**

Industrial facilities often emit toxic air contaminants as "fugitive emissions," such as leaking valves and pipes. Various common urban land uses can produce hazardous pollutants, such as gasoline stations (benzene), dry cleaners (perchloroethylene), and hospitals (ethylene oxide). Automobile exhaust also contains toxic pollutants such as benzene, lead, ethylene dibromide, and ethylene dichloride.

The electronics industry, including semiconductor manufacturing, has a potential for air (and water) contamination because highly toxic chlorinated solvents are commonly used in

production processes. Proper construction and operating standards are required by the City and State considerably reduce this potential.

Other major sources of air pollutants and their effect on public health and welfare are described in detail in the Technical Appendix.

#### **5.9.4 Sensitive Receptors**

A major reason for air quality planning and regulation is to protect the most sensitive members of the population. These include children, the elderly, the acutely ill, and the chronically ill. The term "sensitive receptors" can also refer to the land use categories or buildings where these people live or spend a significant amount of time, such as residences, schools, playgrounds, child care centers, hospitals, retirement homes, convalescent homes, hospitals and clinics.

#### **5.9.5 Air Quality Planning**

Air quality standards are set at levels of concentration above which health or material damage effects have been documented. The ambient air quality standards are set by the Federal Environmental Protection Agency and the State Air Resources Board. They are related to human health and are goals to be met by air pollution control activities.

##### **(a) Regional**

The 1982 Bay Area Air Quality Plan (BAAQP) is the region's non-attainment plan for meeting State and Federal air quality standards. The Plan was prepared by the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District (BAAQMD), and the Metropolitan Transportation Commission (MTC). The Plan includes selected stationary source controls, mobile source controls and transportation controls designed to attain and maintain Air Quality standards in the Bay Area.

The Bay Area Air Quality Management District was created by the California Legislature in 1955. It was the first regional agency dealing with air pollution to be formed in California. The BAAQMD is largely limited to policing non-vehicular sources of air pollution within the Bay Area, primarily industry and burning. Aircraft pollution is subject to Federal control.

##### **(b) Subregional**

Air pollutants do not recognize political boundaries. Often, the policies of one community may adversely impact another community. This may be true with respect to pollutants emitted by motor vehicles or from stationary sources.

Similarly, solutions to air quality problems often transcend municipal and, sometimes, county boundaries. For example, it is inappropriate to expect every small community to provide a balance between jobs and housing to reduce auto pollution. It is more reasonable to consider the subregional jobs/housing balance among several neighboring communities within a commute-shed.

##### **(c) Local**

In most places, local air quality planning will be geared toward minimizing auto travel and reducing exposure to air pollutants.

### **5.9.6 Existing Conditions**

Stationary sources of air pollution and state controls on vehicular emissions have steadily reduced air pollution levels in the Bay Area. Ozone reached its highest levels in 1969, and has shown a 60 percent reduction since that time. Similarly, carbon monoxide, sulfur dioxide, particulate and nitrogen dioxide levels have decreased. These improvements in air quality have been achieved despite both a growing population and increased industrial development in the Bay Area.

However, the standards of the Clean Air Act have not been attained. Thus the Bay Area must re-assess its clean air attainment efforts. Regional agencies are currently updating the Bay Area Air Quality Plan.

### **5.9.7 Future Air Quality**

Unfortunately, studies show that the trend toward lower emissions and cleaner air can be overwhelmed by growth. For example, even with the strict controls imposed on automobile emissions, a steadily increasing number of people, cars, and trips can overcome the gains already realized. To attain ozone and carbon monoxide standards, the region will have to rely on further reduction of vehicle emissions through stricter new car standards, inspection of existing vehicles, cleaner automotive fuels, and transportation management as explained in the Transportation Element.

If the Bay Area Air Quality Management District, in conjunction with the State Air Resources Board, determines that the region's air pollution problem is "serious," then the region must come into compliance with the applicable state standard no later than December 31, 1997.

## **5.10 OPEN SPACE AND OTHER OPEN AREAS**

"Open Space" is defined in the Land Use Element. This section also discusses several other land use categories that have large open grounds.

The rapid urbanization of the Santa Clara Valley has absorbed much of the undeveloped land in the City and has greatly affected the natural environment. Whatever open land the residents of the future are going to have must be conserved through deliberate government action. In the same way, the quality of the environment can no longer be left to chance but must become a concern of every governmental agency.

Santa Clara County operates a system of regional parks that are open to local residents. There are, however, no County parks in the City of Santa Clara. In the long range plan for regional parks, the County has included a Saratoga Creek Trail that would run through the residential area of Santa Clara and another park chain along the Guadalupe River. The County Baylands Park is to be located in Sunnyvale to the northwest of the City. The Saratoga / San Tomas Aquino Creek Trail could connect several City parks, schools and the Baylands area. Both the Saratoga / San Tomas Aquino Creek Trail and the Guadalupe River Trail could connect with the regional Bay Trail, which will link perimeter open space areas around San Francisco and San Pablo Bays. Bicycle and pedestrian access along the creek can be created through the removal of barriers and construction of bypasses.

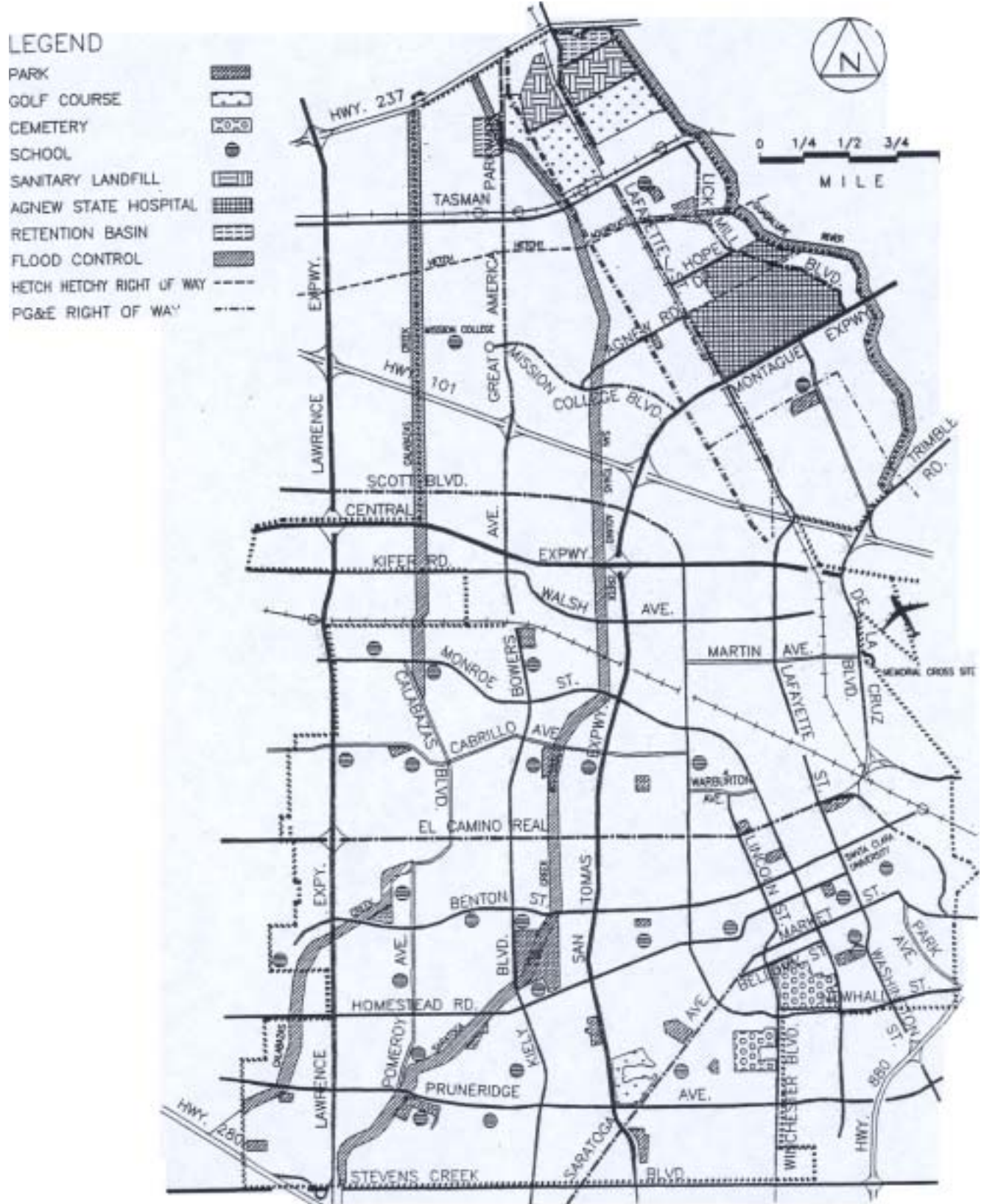
The City currently owns a significant amount of open lands including the park system described in Public Facilities, a golf course and a cemetery. Two factors will determine the amount of open lands the City can preserve in the future: the availability of land and funds.

The residential area of the City south of the Southern Pacific Railroad is almost all developed. The few remaining parcels are so high priced that acquisition costs for open space purposes are prohibitive. The undeveloped land north of the Bayshore is generally unsuitable for neighborhood parks due to the distance involved. An exception would be as part of any new residential development. With good access, however, it is suitable for specialized or larger scale open space and recreation to which users would normally travel.

The Hetch-Hetchy Aqueduct right-of-way east of Lafayette Street and the City's two retention basins also have potential for enhancement through landscaping. The retention basins have become a feeding and resting place for a variety of bird species because of their location near the Baylands.

**Figure 5-N:**

## EXISTING OPEN SPACE AND OTHER OPEN AREAS



An Architectural Committee reviews the design of industrial, commercial, single and multiple residential developments to ensure provision of usable open space.

### **5.11 ARCHEOLOGIC RESOURCES**

Known archeologic sites have been found throughout Santa Clara County. Besides the sites identified within the City of Santa Clara, there may be other undiscovered archeological sites. Indian settlements were related to the abundant food supply in Santa Clara Valley. Movement of the native Indians followed seasonal variations. The bay and its marshlands, the all-year streams, and the oak groves were all attractive living areas and food producers for the Indians.

During the planning stages for construction projects, investigations are conducted to determine the possibility of archeological remains on a site. A plan to preserve sites, removal of remains, along with the recording of the find is to be prepared with the assistance of a professional archeologist.

### **5.12 GOALS**

**The Goals of the Environmental Quality Element are to:**

**Conserve and improve the environmental quality of the City. Continue an emphasis on improving the physical environment of Santa Clara.**

### **5.13 IMPLEMENTATION, POLICIES AND PROGRAMS**

#### **5.13.1 IMPLEMENTATION**

For those programs which require initiating action following the adoption of this General Plan, the anticipated time period for implementation has been provided, followed by the lead department or other City Group responsible for implementation. Ongoing programs have been so identified, along with the responsible lead department or City group. Implementation will be monitored annually by the Planning Commission for compliance with Federal and State Law requirements.

#### **DEFINITION OF CITY IMPLEMENTATION GROUPS**

Arch. Comm.	-	Architectural Review Committee
Bldg. Div.	-	Building Inspection Division, Planning & Inspection Department
City Council	-	City Council
City Mgr.	-	City Manager's Office
Community Srvcs.	-	Community Services Department
Fire Dept.	-	Fire Department
Parks/Rec. Dept	-	Parks and Recreation Department
Planning Div.	-	Planning Division, Planning & Inspection Department
Planning Comm.	-	Planning Commission
Police Dept.	-	Police Department
Public Wks. Dept.	-	Public Works Department
Redev. Agency	-	Redevelopment Agency
Street Dept.	-	Street Department

Water/Sewer Dept. - Water and Sewer Utility Department

### **5.13.2 POLICIES AND PROGRAMS**

#### **Soils and Geology**

##### **Policies**

1. Continue efforts to conserve natural resources and lessen the dependency on sanitary landfill by maximizing reclamation and reuses of materials and energy.
2. Support land reclamation in areas where erosion, landfill activities, hazardous materials storage or disposal, have occurred.
3. Review the City's Building Code regularly and make amendments as necessary to ensure that it contains the most current earthquake design standards.

##### **Programs**

- (i) Require special design considerations and impose constraints on the type of development that may occur on completed landfill. (Ongoing, Bldg. Div., Public Wks. Dept.)
- (ii) Require soil reports where warranted to evaluate specific designs. (Ongoing, Bldg. Div.)
- (iii) Regulate the type, location, and intensity of development to mitigate potential adverse impacts of unstable soils or seismic hazards. (Ongoing, Planning Div., Bldg. Div.)

#### **Hazardous Materials**

##### **Policies**

4. Regulate hazardous materials use, storage, disposal and clean-up to protect the health of humans and the environment within the City of Santa Clara.
5. All proposals to site a hazardous waste management facility shall assure compatibility with neighboring land uses and be consistent with the General Plan (including the Hazardous Waste Siting Constraints map), local land use permitting process, and the County Hazardous Waste Management Plan.

##### **Programs**

- (iv) In conjunction with other responsible agencies, inform all residents about the potential hazards associated with household products and how to dispose of them safely. (Ongoing, Street Dept.)
- (v) Review the siting and/or design of hazardous materials storage, recycling, transfer and disposal facilities for consistency with the County Hazardous Waste Management Plan and policies and programs of this General Plan. (Ongoing, Planning Div.)
- (vi) Work with other agencies to support the reclamation of polluted resources and to prevent new sources of pollution. (Ongoing, Fire Dept., outside

regulatory agencies)

## **Flora and Fauna Policies**

6. Support programs for the protection of fish and wildlife and their habitats, including rare and endangered species.
7. Support conservation of riparian vegetation and habitat.

## **Programs**

- (vii) Continue the City's street tree program to provide a tree for each single family lot. (Ongoing, Street Dept.)
- (viii) Develop a tree protection ordinance. (To be implemented 1992-1995, Street Dept., Planning Div.)
- (ix) Require landscaping in all private developments, especially the use of trees along street frontages and in parking areas. Emphasis shall be on native, drought-tolerant landscaping. (Ongoing, Planning Div.)
- (x) Require adequate levels of landscaped open space in residential developments. (Ongoing, Planning Div.)
- (xi) Restrict development in areas that contain rare or endangered species of plants or animals or in special status species habitat areas unless suitable mitigation can be provided. (Ongoing, Planning Div.)
- (xii) Preclude construction in riparian corridors of structures or improvements, except certain trails, flood control projects, and culverts, fences, pipelines and bridges, and evaluate and mitigate where feasible, biological effects of any such construction. (Ongoing, Planning Div., Public Wks. Dept.)
- (xiii) Establish a creekside setback to protect riparian vegetation, subject to not precluding reasonable development of a parcel. (Ongoing, Planning Div.)
- (xiv) Cooperate with the Santa Clara Valley Water District and other permitting agencies to limit development or flood control measures within riparian corridors to activities necessary for improvement or maintenance of stream flow, or creekside public trails, and to evaluate, for their effects on riparian resources, all actions that could potentially alter stream flow. (Ongoing, Planning Div., Public Wks. Dept.)

## **Water Resources Policies**

8. Provide a reliable, safe supply of potable water adequate to meet present and future needs. Support efforts by the Santa Clara Valley Water District to reduce subsidence.
9. Promote conservation of water, water importation measures, and recharge of the

aquifers, so to ensure an adequate water supply and remain within the allowable quantity of withdrawal or "safe yield" of the groundwater, so not to cause further compaction of aquifers and subsidence of land.

10. Allow urban development only if there exists an adequate domestic water supply to serve this development, and the development would not result in a reduction of water quality below standards set forth in the California Health and Safety Code and the California Administrative Code.
11. Maximize the use of reclaimed water for construction, maintenance and irrigation, and encourage its use elsewhere, as appropriate.
12. Save existing water (through conservation) for new users.
13. Support flood control improvements that will reduce serious flood hazards in the City, through coordination with the Santa Clara Valley Water District.
14. Regulate the type, location and intensity of land uses within flood-prone areas.
15. Identify and construct specific local storm drain facilities needed to accommodate a storm flow having a 10-year frequency.
16. Participate on a regional basis in a Non-Point-Source Control Program in order to reduce pollutants in storm water runoff.
17. Maximize water retention and reduce the quantity of water runoff.
18. Encourage programs to improve the quality of storm water runoff.

### **Programs**

- (xv) Promote water conservation through development standards, building requirements, landscape design guidelines, and other applicable citywide policies and programs, including water rates and public education. (Ongoing, Planning Div., Bldg. Div., Water/Sewer Dept.)
- (xvi) Import additional water supply to Santa Clara from alternative sources. (To be implemented 1992-1995, Water/Sewer Dept.)
- (xvii) Continue to monitor the quality of drinking water. (Ongoing, Water/Sewer Dept.)
- (xviii) Establish fair and equitable fees, rates, and charges for water, geared to promoting conservation and paying for new and expanded facilities. (Ongoing, Water/Sewer Dept.)
- (xix) Develop water transmission alternatives to ensure a reliable supply in the north of Bayshore area. (Ongoing, Water/Sewer Dept.)
- (xx) Encourage the Santa Clara Valley Water District to improve the Santa Clara

Distributary to provide more water to the southerly portion of the City.  
(Ongoing, Water/Sewer Dept.)

- (xxi) Implement the Santa Clara Valley Nonpoint Source Pollution Control Program. (Ongoing, Water/Sewer Dept.)
- (xxii) Prior to approval of a building plan which involves the placement of piles or other design features which may result in degradation of the groundwater, applicants shall be required to gain approval from the Santa Clara Valley Water District regarding the depth and placement of piles or the nature of design. (Ongoing, Bldg. Div.)

### **Air Quality Policies**

- 19. Protect the air quality of the City of Santa Clara and its sphere of influence. Promote land use and transportation policies which maintain air quality.

### **Programs**

- (xxiii) Support reasonable and practical Federal and State air quality standards for local pollutants of concern, including standards for new cars and requirements for inspecting all vehicles. (Ongoing, City Council)
- (xxiv) Evaluate potential air quality impacts of and on proposed development. (Ongoing, Planning Div.)
- (xxv) Support specific local construction and operating standards for the electronics industry. (Ongoing, Air Quality District)
- (xxiv) Require construction contractors to implement dust abatement programs. (Ongoing, Bldg. Div.)

### **Noise Policies**

- 20. Protect to the extent possible existing developed areas of the City of Santa Clara from unacceptable noise levels.
- 21. Reduce transportation generated noise within the City of Santa Clara where feasible.
- 22. Comply with City, State and Federal guidelines for the compatibility of land uses with their noise environments, except where the City determines that there are prevailing circumstances of a unique or special nature.
- 23. Within the San Jose Airport noise impact area, maintain residential neighborhoods as designated in the Land Use Element. Permit appropriate residential development in these neighborhoods subject to noise insulation.
- 24. Reduce noise from fixed sources, construction, and special events.

25. Prohibit any significant new residential development in the adverse noise environment created by the San Jose International Airport (65 CNEL and over).
26. Maintain the separation between industrial and residential uses to reduce noise conflict.
27. Establish a noise and land use compatibility chart as the basic City noise standard.

### **Programs**

- (xxvii) Regulate existing noise sources through the City's Noise Ordinance and other applicable codes. (Ongoing, Planning Div.)
- (xxviii) Evaluate the impacts of new noise sources on the community and identify appropriate mitigation. (Ongoing, Planning Div.)
- (xxix) Adopt, periodically evaluate, and update as appropriate, community noise impact and attenuation standards. (Ongoing, Planning Div.)
- (xxx) Guide the location and design of transportation facilities so as to minimize the effects of noise on adjacent land uses. (To be implemented beginning in 1992, Planning Div., Planning Comm., City Council)
- (xxxi) Support construction of noise barriers along railroads, freeways and expressways where adjacent to residences. (To be implemented beginning in 1992, Planning Div., Planning Comm., City Council)
- (xxxii) Pursue and support stronger noise policies and implementation measures for the San Jose Airport that will reduce its noise impact on Santa Clara residents (such as only allowing "quiet aircraft" in future leases and renewals with air carriers). (To be implemented beginning in 1992, Planning Div., Planning Comm., City Council.)
- (xxxiii) Utilize technological improvements that reduce noise and are economically feasible when purchasing new City equipment. Encourage others to do the same. (Ongoing, City Mgr.)
- (xxxiv) Support State and Federal legislation to reduce noise levels for new vehicles as well as State muffler and exhaust law. (To be implemented beginning in 1992, City Mgr., City Council)
- (xxxv) Support legislation to lower the noise levels of civilian aircraft and mass transit facilities. (To be implemented beginning in 1992, City Mgr., City Council)
- (xxxvi) Review and comment (through ALUC and various airport committees) on proposed airport projects that will adversely affect the noise environment in Santa Clara. (Ongoing, Planning Division, City Mgr., City Council)
- (xxxvii) Support sound insulation programs for residences in the airport noise impact

area. (Ongoing, City Mgr., City Council)

- (xxxviii) Require industrial uses near residential areas to build solid walls facing residences, provide deep areas of heavy landscaping along common property lines, and place compressors in sound-proof enclosures. (Ongoing, Planning Div., Bldg. Div.)
- (xxxix) Continue to enforce City-adopted sound transmission criteria for apartment buildings and condominiums. (Ongoing, Bldg. Div.)

### **Open Space Policies**

- 28. Encourage multiple use of land such as schools, parking lots, utility easements and flood control channels.
- 29. Promote private open space and recreation facilities in large-scale residential developments and employment centers in order to meet a portion of the urban open space and recreation needs that will be generated by the development.
- 30. Evaluate land development along designated trails and pathway corridors in order to provide sufficient right-of-way and ensure compatibility with scenic and aesthetic qualities.
- 31. Encourage development of regional open space in the vicinity of Santa Clara.
- 32. Make prudent use of open space and recreation revenue sources such as Federal and State grants, private dedications and user fees.
- 33. Seek construction of appropriate facilities for recreation and cultural events in areas which minimize conversion of existing open space.
- 34. Maintain public view corridors to the extent practical.

### **Programs**

- (xl) When new development occurs adjacent to a designated trails and pathway corridor, the City may require the development to install and maintain the trail in that area. (Ongoing, Planning Div.)
- (xli) Require the design of bridges and other public improvements within designated trails and pathways corridors to provide safe and secure routes for trails, including grade separation between roadways and trails whenever feasible. (Ongoing, Public Wks. Dept.)
- (xlii) Encourage the Santa Clara Valley Water District, school districts, PG&E, and other public agencies and utilities to provide appropriate recreation uses on their respective properties and rights-of-way. (Ongoing, Planning Div.)
- (xlili) Cooperate with local school districts in preserving identified school sites appropriate for public recreational use. (Ongoing, City Mgr.)

- (xliv) As development and redevelopment occur, the City may require public access to trails from nearby public street and sidewalk rights-of-way. (Ongoing, Planning Div.)
- (xlv) Encourage private development of recreation facilities. (Ongoing, Planning Div.)
- (xlvi) Encourage the use of school buildings and grounds after school hours. (To be implemented beginning in 1992, City Mgr., Parks/Rec. Dept., City Council)

**Archaeology  
Programs**

- (xlvii) Continue to require archeological investigations of all proposed construction sites in sensitive area, such as within 500 feet of a natural watercourse. An archaeological survey shall be prepared by the project applicant to the City's satisfaction, including limited subsurface excavation, and possibly to include a detailed subsurface investigation when important resources cannot be avoided. (Ongoing, Planning Div., Bldg. Div.)
- (xlviii) Continue to require prior to development, whenever archeological remains are found, a plan for preserving, removing, and recording the find, to be prepared to the City's satisfaction by a professional archeologist. (Ongoing, Planning Div., Bldg. Div.)

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